

REMARKS/ARGUMENTS

The claim 1 has been amended to emphasize some of the more important features of the inventive process, not taught or suggested in the cited references. For example, it is important that the feed containing at least 50 % wax in step (a) be subjected to hydrocracking under conditions that between 40% to 70% wax conversion is achieved. Support for this amendment is found on page 14 of the specification, lines 18-24. Applicants found that maintaining the wax conversion in step (a) in this range, substantially improves the yield of the base oil product, which base oil product can be used to prepare a lubricant having the desired dynamic viscosity of below 5000 cP at -35 °C. This latter limitation is now specifically recited as part of step (c) in claim 1.

Claim 1 also now specifies that the effluent from step (b) have a pour point below -10 °C. Support for this amendment is found on page 19 of the specification, lines 32-33.

Claim 2 has been amended to specify the preferred pour point (below -20 °C) and preferred viscosity index range (from 130 to 180) for the effluent from step (b). Support for the amendments to claim 2 is found on page 19 of the specification, line 32, to page 20, line 2.

Claim 3 has been amended to include a limitation previously found in claim 2.

Claims 8 and 10 have been amended to change their dependency.

Claim 15 has been amended to correct a typographical error.

New claim 22 specifies a preferred wax conversion range in step (a) of from 45 to 60 %, while new claim 23 recites the embodiment of the invention wherein gas oil and kerosene products having excellent low temperature properties are separated from the effluent of step (b). Support for these amendments is found on page 14 of the specification, lines 18-22, and page 14, lines 11-15.

Claim Rejections - 35 U.S.C. § 103

The rejection of claims 1- 14 and 16-21 under 35 US.C. § 103 (a) as being unpatentable over Van Ballegoy et al (WO00/29511) in view of Nalesnik et al (US 6,103,674) is respectfully traversed.

The present invention provides a process for preparing a lubricant having a dynamic viscosity at -35 °C of below 5000 cP by performing specific three steps. The first step (a) involves hydrocracking a feed containing more than 50 wt% wax by contacting the feed in the

presence of hydrogen with a specified catalyst under hydrocracking conditions sufficient to achieve between 40 and 70 wt% wax conversion.

The second step (b) involves catalytically dewaxing the effluent from step (a) by contacting it with specified catalyst composition comprising a noble Group VIII metal, a binder and zeolite crystallites of the MTW type to obtain a base oil product in high yield having a pour point below -10 °C and a viscosity index greater than 120. The third step (c) involves adding a pour point depressant additive to the base oil product obtained in step (b) which results in the desired lubricant product having a dynamic viscosity at -35 °C of below 5000 cP.

Applicant respectfully submits the foregoing three steps needed to produce a lubricant having the recited properties in high yield are not taught by or suggested by the cited references.

Van Ballegoy et al discloses a catalytic dewaxing process comprising contacting a wax containing feed with a catalyst composition comprising any of a variety of metallosilicate crystallites including MFI-type zeolites, TON-type zeolites and MTW-type zeolites, a binder and a hydrogenation component which can be a Group VIII noble metal, wherein the weight ratio of the metallosilicate crystallites to the binder is between 5:95 and 35:65. The catalytic dewaxing process in Van Ballegoy et al is somewhat similar to step (b) of the present process, except Van Ballegoy et al teaches MFI-type zeolites, TON-type zeolites and MTW-type zeolites are all preferred, while Applicants have found that the use of MTW-zeolites is important to obtaining a lubricant having the properties recited in claim 1.

But the more important point is that Van Ballegoy et al does not teach step (a) of the present process wherein the wax-containing feed is hydrocracked under conditions to achieve a 40 to 70% wax conversion, which Applicants have found is important to obtaining high yields of base oil product suitable for preparing a lubricant having a dynamic viscosity at -35 °C of below 5000 cP. Van Ballegoy is not at all concerned with the preparation of lubricants having the aforementioned dynamic viscosity properties, and does not teach the importance of achieving a wax conversion of between 40 and 70% in step (a), both of which limitations have been included by amendment in claim 1.

On page 4, lines 4-8, of Van Ballegoy it is disclosed that prior to the catalytic dewaxing process of the invention, it is preferable that the vacuum distillate fraction or any other sulfur or nitrogen containing feedstock be hydrotreated "to reduce the concentration of sulfur and/or nitrogen in the feed". However, there is no teaching or suggestion of hydrocracking the wax-containing feedstock under conditions to achieve a specific wax conversion of 40 to 70 % prior to catalytic dewaxing step. While it is generally known to hydrocrack wax-containing feeds,

hydrocracking to this specific range of wax conversion is not believed to be taught or suggested in the art, nor would this range be obvious since one would normally attempt to achieve as high a wax conversion as possible, e.g., 80 % or more.

Moreover, as recognized by the Examiner, Van Ballegoy et al does not teach step (c) of present claim 1, which involves adding a pour point depressant additive to the base oil product obtained in step (b). The Examiner apparently relies on Nalesnik et al for this teaching. However, this reliance is misplaced for the reasons discussed below.

Nalesnik et al discloses a novel class oil-soluble molybdenum-based multifunctional friction modifier additives comprising the reaction product of an unsaturated or saturated ester or acid, a diamine, carbon disulfide and a molybdenum compound (Abstract). Nalesnik et al does disclose in col. 12, lines 44-63, that a number of other additives, including a pour point depressant, can be blended into the base oil together with the molybdenum-based friction modifiers. Nalesnik makes no distinction as to which base oils the additives should be added, and in fact teaches that any of a variety of natural or synthetic base oil stocks is suitable (Col.13, lines 41-56).

Applicants have found (as demonstrated by the data presented in Fig. 5 of the present application) that the base oil to which the pour point additive is added is very important. Thus, step (c) of present claim 1 requires that the pour point depressant be added to a very specific "base oil", i.e., the base oil product obtained in step (b) in order to obtain a lubricant having very specific properties, i.e., a dynamic viscosity at -35 °C of below 5000 cP.

It is respectfully submitted that the addition of a pour point depressant to the base oil product of step (b) to obtain a lubricant having a dynamic viscosity at -35 °C of below 5000 cP is not obvious from Nalesnik et al, alone or in combination with van Ballegoy et al, since neither reference concerns the preparation of lubricants having the specified dynamic viscosity, and since Nalesnik teaches the type and nature of base oil to which the additives are added is not important.

For all the above reasons, claim 1 (and claims 2-14 and 16-21, all of which are directly or indirectly dependent on claim 1 and therefore contain the limitations of claim 1), are believed to be patentable over Ballegoy et al either alone or in combination with Nalesnik et al.

The rejection of claim 15 under 35 U.S.C. § 103 (a) as being unpatentable over Van Ballegoy et al (WO00/29511) in view of Nalesnik et al (US 6,103,674), and further in view of Nakagawa (US 5,425,933) is respectfully traversed.

In the subject Office action it is stated that Nakagawa teaches “zeolites can be leached with a chelating agent” which is true. However, present claim 15 has nothing to do with using chelating agents to leach zeolites. Instead claim 15 recites using a chelating agent during the impregnation of nickel and tungsten on the acid amorphous silica-alumina carrier. An acid amorphous silica-alumina carrier is not a zeolite. Zeolites are crystalline, not amorphous. Therefore, the teaching in col.9, lines 21-26 that a “zeolite can be leached with chelating agents” does not teach or reasonably suggest using a chelating agent to facilitate the impregnation of nickel and tungsten on an acid amorphous silica-alumina carrier.

While Nakagawa does not suggest using a chelating agent during the impregnation of nickel and tungsten on an acid amorphous silica-alumina carrier, Applicants are not relying on this limitation alone for the patentability of claim 15. Claim 15 is indirectly dependent on claim 1, and thus contains the limitations in claim 1 that wax-containing feed is hydrocracked in step (a) under conditions to achieve a 40 to 70% wax conversion, and that a pour point depressant be added to the base oil product of step (b) to obtain a lubricant having a dynamic viscosity at – 35 °C of below 5000 cP. Since neither of these limitations is taught or reasonably suggested by the art of record, claim 15 is believed to be patentable over the cited references for the same reasons claims 1-14 and 16-21 are patentable over these references.

For all of the above reasons, and in view of the amendments, all of the claims now in the application (claims 1-23) are believed to be patentable and in condition for allowance, which action is respectfully requested.

Respectfully submitted,

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